

Amendments to the Claims

Claims 1-54 (canceled)

55. (new) A portable apparatus for in-field and laboratory measurement of reduced inorganic sulfur content of a sample comprising: a reaction chamber for receiving a sample to be analysed, means for introducing a selective reducing agent or a precursor of a selective reducing agent that selectively converts the reduced inorganic sulfur of a sample in the reaction chamber to hydrogen sulfide, an acid reservoir for holding an acid for supply to the reaction chamber, detection means for continuously measuring the amount of hydrogen sulfide evolved by reaction of the selective reducing agent with the sample during said reaction, said detection means being selected from the group consisting of a colourimetric detector, an electrochemical gas analyzer, a UV spectrometer and an IR spectrometer, a conduit for supplying hydrogen sulfide evolved in the reaction chamber to the detection means, control means for controlling operation of the apparatus, said control means controlling at least operation of the detection means during analysis of the sample, and a trap for removing hydrogen sulfide from an exit gas stream leaving the apparatus.

56. (new) An apparatus as set forth in claim 55 further comprising a conduit means connecting the acid reservoir to the reaction chamber and wherein said control means controls transfer of acid from the acid reservoir to the reaction chamber such that a predetermined amount of acid is supplied to the reaction chamber.

57. (new) An apparatus as set forth in claim 55 further comprising signaling means for signaling when evolution of hydrogen sulfide has ceased or reduced below a predetermined level.

58. (new) An apparatus as set forth in claim 57 wherein the detection means detects when evolution of hydrogen sulfide has ceased or reduced below a predetermined level and whereafter the controller issues a signal to an operator to signal that the evolution of hydrogen sulfide has ceased or reduced below a predetermined level.

59. (new) An apparatus as set forth in claim 55 further comprising a pump for delivering acid from the acid reservoir to the reaction chamber, and wherein operation of the pump is controlled by the controller.

60. (new) An apparatus as set forth in claim 55 further comprising heating means for heating the reaction chamber.

61. (new) An apparatus as set forth in claim 60 wherein operation of the heating means is controlled by the controller.

62. (new) An apparatus as set forth in claim 55 further comprising a source of inert or non-reactive gas for supply to the reaction chamber, and a conduit for supplying the inert or non-reactive gas to the reaction chamber.

63. (new) An apparatus as set forth in claim 62 wherein the inert or non-reactive gas carries evolved hydrogen sulfide from the reaction chamber to the detection means.

64. (new) An apparatus as set forth in claim 62 wherein supply of the inert or non-reactive gas to the reaction chamber is controlled by the controller.

65. (new) An apparatus as set forth in claim 55 wherein the selective reducing agent is selected from the group consisting of Cr(II), and Sn(II).

66. (new) An apparatus as set forth in claim 65 wherein the selective reducing agent is acidified chromous chloride and the selective reducing agent is formed by mixing chromous chloride with hydrochloric acid in the reaction chamber.

67. (new) A portable apparatus for in-field and laboratory measurement of reduced inorganic sulfur content of a sample comprising: a reaction chamber for receiving a sample to be analysed, means for introducing a selective reducing agent or a precursor of a selective reducing agent that selectively converts the reduced inorganic sulfur of a sample in the reaction chamber to hydrogen sulfide, an acid reservoir for holding an acid, a conduit means connecting the acid reservoir to the reaction chamber, a heating means for heating the reaction chamber, a detection means for continuously measuring the amount of hydrogen sulfide evolved by reaction of the selective reducing agent with the sample during said reaction, a conduit for supplying hydrogen sulfide evolved in the reaction chamber to the detection means, a source of inert or non-reactive gas for supply to the reaction chamber and a conduit for supplying the inert or non-reactive gas to the reaction chamber, a trap for removing hydrogen sulfide from an exit gas stream leaving the apparatus, and computer control means for controlling operation of the apparatus, said computer control means being operative,

upon initiation of an analysis by an operator, to transfer acid from the acid reservoir to the reaction chamber, to initiate operation of the heating means, to initiate operation of the detector means, to monitor a level of evolution of hydrogen sulfide from the reaction chamber and to initiate supply of the inert or non-reactive gas to the reaction chamber, said computer control means being further operative, upon detection that evolution of hydrogen sulfide has ceased or decreased to below a predetermined level, to turn off the heating means, to disengage the detection means, to interrupt the supply of inert or non-reactive gas and to signal that evolution of hydrogen sulfide has ceased or decreased to below a predetermined level.

68. (new) An apparatus as set forth in claim 67 wherein the selective reducing agent is selected from the group consisting of Cr(II), Sn(II) and Hg(II).

69. (new) An apparatus as set forth in claim 68 wherein the selective reducing agent is acidified chromous chloride and the selective reducing agent is formed by mixing chromium with hydrochloric acid in the reaction chamber.

70. (new) An apparatus as set forth in claim 67 wherein the inert or non-reactive gas is nitrogen.

71. (new) An apparatus as set forth in claim 67 wherein, upon initiation of an analysis run by an operator, the computer control means is operative to sequentially initiate supply of the inert or non-reactive gas to the reaction chamber to purge the apparatus, initiate transfer of acid from the acid reservoir to the reaction chamber, and initiate operation of the heating means, said control means also initiating operation of the detection means.

72. (new) An apparatus as set forth in claim 67 further comprising a condenser interposed between the reaction chamber and the detection means, and coolant supply means for supplying coolant to the condenser, and wherein the computer control means controls supply of coolant to the condenser.

73. (new) An apparatus as set forth in claim 67 wherein said detection means is selected from the group consisting of a colourimetric detector, a turbidimetric detector, a gravimetric detector, an electrochemical gas analyzer, a UV spectrometer and an IR spectrometer.